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## NOTICE OF ALLOWANCE AND FEE(S) DUE

7590 04/03/2008

Jessica M Sinnott  
E I du Pont de Nemours and Company  
Legal - Patents  
4417 Lancaster Pike  
Wilmington, DE 19898

EXAMINER

HU, HENRY S

ART UNIT

PAPER NUMBER

1796

DATE MAILED: 04/03/2008

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/523,492

02/03/2005

Andrew E. Feiring

SR0020USPCT

1866

TITLE OF INVENTION: PHOTORESISTS, FLUOROPOLYMERS AND PROCESSES FOR 157 NM MICROLITHOGRAPHY

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1440	\$300	\$0	\$1740	07/03/2008

**THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.**

**THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.**

### HOW TO REPLY TO THIS NOTICE:

#### I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

**IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.**

# **PART B - FEE(S) TRANSMITTAL**

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

7590

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Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

## **Certificate of Mailing or Transmission**

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/523,492	02/03/2005	Andrew E. Feiring	SR0020USPCT	1866

TITLE OF INVENTION: PHOTORESISTS, FLUOROPOLYMERS AND PROCESSES FOR 157 NM MICROLITHOGRAPHY

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1440	\$300	\$0	\$1740	07/03/2008

EXAMINER	ART UNIT	CLASS-SUBCLASS
HU, HENRY S	1796	526-250000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 \_\_\_\_\_
- (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 \_\_\_\_\_
- 3 \_\_\_\_\_

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies \_\_\_\_\_

4b. Payment of Fee(s); (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number \_\_\_\_\_ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature \_\_\_\_\_

Date \_\_\_\_\_

Typed or printed name \_\_\_\_\_

Registration No. \_\_\_\_\_

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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EXAMINER

HU, HENRY S

ART UNIT

PAPER NUMBER

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## Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 54 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 54 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

**Notice of Allowability**

Application No.

10/523,492

Applicant(s)

FEIRING ET AL.

Examiner

Art Unit

HENRY S. HU

1796

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Amendment of February 19, 2008.
2. ☒ The allowed claim(s) is/are 1-14.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some\* c) ☐ None of the:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
- \* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |  |  |
|--|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 5. <input type="checkbox"/> Notice of Informal Patent Application                      |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 6. <input type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),<br>Paper No./Mail Date _____    | 7. <input type="checkbox"/> Examiner's Amendment/Comment                               |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance   |
|  | 9. <input type="checkbox"/> Other _____.   |

### DETAILED ACTION

1. This office action is in response to **Amendment** filed on February 19, 2008, which is in response to second non-final action filed on October 18, 2007. Non-elected two groups including **Claims 15-33 (Group II) and Claim 34-36 (Group III)** have been previously cancelled, while no claim was currently amended, cancelled or added. **Claims 1-14 are pending now** with only **one** independent claim (Claim 1). An action follows.

2. Claim rejections under second Non-Final Office Action filed on October 18, 2007 are now removed for the reasons given in paragraphs 3-9 thereafter.

### *Allowable Subject Matter*

3. Claims 1-14 are allowed.

4. The following is an examiner's statement of reasons for allowance: The above Claims 1-14 are allowed over the closest references:

5. The limitation of parent **Claim 1** in present invention relates to **a fluorine~containing copolymer** comprising **two** monomer units including:

*(A) a repeat unit derived from an ethylenically unsaturated compound having **at least one fluorine atom** covalently attached to an ethylenically unsaturated carbon atom; and*

*(B) at least a repeat unit derived from an ethylenically unsaturated cyclic compound of structure (I) with a four-membered ring and all factors are specified as: (a) n is 0, 1, or 2; and (b) R<sup>1</sup>, R2, R3 and R4 are independently from: (b1) H; (b2) C<sub>1-10</sub> alkyl or alkoxy, optionally substituted by halogen or ether oxygens; or (b3) C<sub>6-20</sub> aryl.*

*See other limitations of dependent Claims 2-14.*

6. In view of the Applicants' amendment and detailed argument on pages **6-8** of Remarks, **103 rejections** relying on **three** primary references in combination including **Shepherd (US 3,810,949)**, **Sauers et al. (J. Org. Chemistry, vol. 6, pp. 2175-2181, (1968))**, or **Shepherd (US 4,002,691)**, each individually in view of secondary references including **Kobo et al. (US 5,229,473)** and/or **Brasen (US 2,928,,865)** cannot stand for parent Claim 1 as following:

Applicants have now claimed in amended parent **Claim 1** an unexpected way of obtaining **a fluorinated copolymer** comprising **two repeating units** from: (A) at least one fluoroolefin having at least one fluorine atom attaching to double bond and (B) at least one **polycyclic olefin** having a formula of (I) containing a **"four"-membered ring** with factors specified as: (a) n is 0, 1, or 2; and (b) R<sup>1</sup>, R2, R3 and R4 are independently from: (b1) H; (b2) C<sub>1-10</sub> alkyl or alkoxy, optionally substituted by halogen or ether oxygens; or (b3) C<sub>6-20</sub> aryl. As discussed earlier, each of **Shepherd (949)**, **Sauers and Shepherd (691)** is "at least" silent about **specifically** using such type unsaturated cyclic or polycyclic compound or monomer to be copolymerized with the claimed fluorinated ethylenically unsaturated compound (a).

7. As exactly pointed out by Applicants, **Shepherd (949)** may have disclosed the preparation allyl group-containing compound to be useful as monomers (see column 18, line 73-75; column 13, line 15-25. However, the polymerizable moiety is on the double bond from allyl group, and is not on the double bond of alicyclic ring. In fact, the claimed compounds of structure (I) in parent Claim 1 do not possess an allylic substituent, but instead possess an *internal* double bond that polymerizes with the ethylenically unsaturated compound having at least one fluorine atom.

**Sauers** only discloses the chemical reaction on the double bond and/or on the high strained four-membered ring (see chemical reactions on page 2177 for compounds 25, 26, 29, 30 and 31). No polymerization is disclosed or suggested at all. **Shepherd (691)** only discloses the preparation of acetate ester compound at column 2, line 60 – column 3, line 12. No polymerization is disclosed or suggested at all. Accordingly, Shepherd (949), Sauers, and Shepherd (691) do not teach or suggest that compounds of structure (I) are useful monomers for polymerization with any of ethylene, fluorinated ethylene and the like monomers.

8. **Even two secondary references including Kobo and Brasen in combination or alone may disclose some parts (but not all) of the limitations, a motivation to link is still lacking since the involved chemical structure is at least some different.** For instance, **Kobo et al.**

only discloses a method for the production of the claimed fluorinated copolymer by using an almost the same monomer (b) (see formula (II) on abstract) except the ring ring size is five or six but not four. **Brasen** only discloses a method for the production of the claimed fluorinated copolymer by using an almost the same monomer (b) having a four membered ring except the ring substituents (see column 1, line 27-34; also see example 1 at column 4, line 64) are NOT reading on the claimed monomer (b). The sole tertiary reference **Wheland** only discloses two things as: (A) attaching a fluorinated alcoholic group such as  $-C(R_F)(R_F)-OH$  (which is treated as an acid as known in the art) and the like as well as its protected substituents onto the monomer (paragraphs 0063-0067 and 0079), and (B) adding additional monomer which is acid-containing or protected acid-containing for copolymerization use. Therefore, Wheland cannot fix the deficiency of primary and secondary references.

9. **The claimed monomer (b) structures are at least somewhat different from those of the six references** in view of its chemistry, reactivity and preparation. Particularly the fused ring is high strained four-membered ring rather than regular five and six. As known in the art, it may take tremendous synthetic effort to prepare such a claimed group onto cyclic or polycyclic ring at the desired position even the chemical structure is only different on one carbon or one position.

10. After further examination and search, the examiner found the following prior art did not teach the claimed limitation:



**EP 1,246,013 A2 to Feiring** et al. only discloses a process for the formation of photoresist by using a fluorinated copolymer having polycyclic rings (abstract, line 1-18; paragraphs 0010-0012). Although **the ring structure having outer alicyclic ring of four on page 5 at line 1-15 is fundamentally reading on the claimed formula (I)**, it still does not carry the claimed factor limitation on R<sup>1</sup>, R2, R3 and R4. Although **the ring structure on page 10 at line 20-30 is “almost” reading on the claimed formula (I)**, it still does not carry the claimed outer ring size of four since the factor of **p is an integer of “three or more”, which thereby makes at least five membered ring or larger** (page 10, line 57). Therefore, Feiring fails to teach or fairly suggest the copolymer of present invention. It is noted that such an EP patent carries a **later** publication date of **October 2, 2002** in comparing with US effective filing date of **August 9, 2002** for instant Application.

11. The key issue is that different chemical structures are involved and there is no existence on functional equivalence and interchangeability so as to replace it with the claimed group at the claimed position. Therefore, the present invention is novel.

12. As of the date of this office action, the examiner has not located or identified any reference that can be used singularly or in combination with another reference including the above references to render the present invention anticipated or obvious to one of the ordinary skill in the art. Therefore, the independent and parent **Claim 1** is allowed for the reason listed above. Since the prior art of record fails to teach the present invention, the remaining pending dependent **Claims 2-14** are passed to issue.

13. Any inquiry concerning this communication or earlier communication from the examiner should be directed to **Dr. Henry S. Hu whose telephone number is (571) 272-1103**. The examiner can be reached on Monday through Friday from 9:00 AM –5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan, can be reached on (571) 272-1119. The **fax** number for the organization where this application or proceeding is assigned is **(571) 273-8300** for all regular communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

//Peter D. Mulcahy//  
Primary Examiner, Art Unit 1796

/Henry S. Hu/  
Examiner, Art Unit 1796

March 25, 2008